DETAILED ACTION

1. The amendment filed on 09/25/2009 has been entered and fully considered. Claims 2, 3 and 10 are canceled. Claims 1, 4-9 and 11-19 are pending, of which Claims 1, 4, 7 and 11 are amended, Claims 13-19 are withdrawn, Claims 1, 4-9, 11 and 12 are considered on merits.

Response to Amendment

2. In response to amendment, the examiner modifies rejection over the prior art established in the previous Office action.

Claim Rejections – 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claims 1, 4-7, 9, 11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al. (US 2001/0054281, IDS) (Adams).

In regard to Claim 1, Adams teaches a method of determining activity and aging behavior of a catalyst by producing a first substream combustion offgases by a first combustion process and a stream of hot combustion offgases having a defined pollutant composition by mixing the first substream of hot combustion offgases with the second substream (additional exhaust gas or contaminant by a contaminant supplier 266), passing the combustion offgases over the catalyst to be tested and determining the pollutant conversions effected by the catalyst (250) (see paragraph [0030] [0034] and [0037], Figure 4-5). Adam teaches that the second substream is “additional exhaust gas”, which implies that the second substream is produced by a second combustion process.

Adam does not specifically teach that the first substream of hot combustion offgases makes up from 60 to 95% of the total mass flow of the two substreams. Adam teaches that the second substream of hot combustion offgases is the minor substream in the mixture of the two substreams (see paragraph [0037]). Therefore, the first

substream of hot combustion offgases makes up from 60 to 95% of the total mass flow of the two substreams is obvious based on Adam's teaching.

Adam teaches that the first substream of hot combustion offgases is produced by burning a motor fuel in a first stream of combustion air (see paragraph [0030] [0034]). Adam does not explicitly teach that the second substream of hot combustion offgases is produced by burning gaseous hydrocarbons in a second stream of combustion air. Since Adam teaches that the second substream of hot combustion offgases is different from the first one (see paragraph [0037]), it must be produced by burning fuels other than motor fuel. Gaseous hydrocarbons have been conveniently used as domestic fuels for cooking and heating. At the time of the invention it would have been obvious to one of ordinary skill in the art to produce the second substream of hot combustion offgases by burning gaseous hydrocarbons in a second stream of combustion air, because gaseous hydrocarbons is a convenient fuel to use.

Adam teaches that the temperature of the first substream of combustion offgases is reduced to a value by passing through a heat exchanger (230) before it is mixed with the second substream of combustion offgases (see paragraph [0037], Figure 5). Adam further teaches that the system has the capability to maintain the exhaust gas in a range as shown in Figure 9. In Figure 9, the temperatures of some of the test sample are maintained in a range between 200 to 800ºC (see Figure 9).

In regard to Claim 4, Adam teaches that air to fuel ratio exceeding about 15.5 are similarly possible, with ratios of about 17 and even about 18 or greater possible (see paragraph [0046]). That means the first substream of hot combustion offgases has an air ratio lambda of greater than 1.

In regard to Claim 5, Adam does not specifically teach that ammonia or aqueous ammonia is introduced into the first and/or second stream of combustion air in order to increase the nitrogen oxide concentration in the combustion offgases. Adam teaches that contaminant can be added to the exhaust gas flow (see paragraph [0047]). Nitrogen oxide is one of the contaminants found in exhaust gas. Ammonia oxidizes to nitrogen oxide. At the time of the invention, it would have been obvious to ordinary skill in the art to add ammonia as contaminant in to the stream of combustion air as taught

by Adam in order to increase the nitrogen oxide concentration in the combustion offgases.

In regard to Claim 6, Adam teaches that contaminant can be added to the exhaust gas flow (see paragraph [0047]). Poisoning elements in the form of precursor compounds are contaminants that could damage the catalyst. It would have been obvious to ordinary skill in the art to add the poisoning elements as contaminant to the motor fuel as taught by Adam to test the catalyst aging.

In regard to Claim 7, Adam teaches that the air to fuel ratio can be adjusted in a very wide range (7 to 18) (see paragraph [0046]). Adam also teaches that the second substream of combustion offgases is a minor component of the two streams used to adjust the composition of the offgases (see paragraph [0037). Which means the air ratio lambda of the second substream of combustion offgases can be set to a wide range, from 0.5 to more then 1. Even lambda of 3 is reasonably possible because the second substream is a minor substream in the combustion offgases.

In regard to Claim 9, Adam teaches that any contaminant commonly found in exhaust gases can be added into the second substream of combustion (see paragraph [0037]). One kind of the contaminants commonly found in exhaust gases of engine is the incompletely oxidized hydrocarbons. Therefore, at time of the invention it would have been obvious to ordinary skill in the art to add hydrocarbons which is difficult to oxidize into the gaseous hydrocarbons to test the catalyst as taught by Adam.

In regard to Claim 11, in addition to hydrocarbons that has been discussed above, Adam also teaches that oil additives (ZDP) or further gaseous or vaporizable components (any contaminants commonly found in exhaust gas) can be added to the mixed combustion offgases before they are brought into contact with the catalyst (see paragraph [0037]).

In regard to Claim 12, Adam teaches that the temperature of the mixed combustion offgases is set to a defined value before contact with the catalyst (see paragraph [0034]).

5. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams in view of Neeft et al. (Fuel, 1997) (Neeft).

In regard to Claim 8, Adam does not specifically teach that water is introduced into the second stream of combustion air in order to avoid soot formation in the case of extremely rich operating conditions. Neeft teaches the influence of water on the rate of oxidation of soot. Neeft teaches that water causes a significant increase in oxidation rate of the flame soot, which accompanied by an increase in reaction order in carbon and a much higher CO_2/CO ratio (see abstract). Since the second substream is the offgases by burning gaseous hydrocarbons, adding water into the second stream of combustion air will reduce the formation of soot in the case of extremely rich operation conditions based on Neeft's teaching. Therefore, it would have been obvious to ordinary skill in the art to introduce water into the second stream of combustion air in order to avoid soot formation in the case of extremely rich operating conditions.

Response to Arguments

6. Applicant's arguments filed 09/25/2009 have been fully considered but they are not persuasive.

Applicant argues that Adams is silent on the first substream of hot offgases makes up from 60 to 90% of a total mass flow of the two substreams. Adam teaches that the second substream of hot combustion offgases is the minor substream in the mixture of the two substreams (see paragraph [0037]). Therefore, the first substream of hot combustion offgases makes up from 60 to 95% of the total mass flow of the two substreams is obvious based on Adam's teaching.

Applicant argues that Adam is silent on reducing the temperature of the first substream of combustion offgases to a value in a range from 800 to 200°C before it is mixed with the second substream of combustion offgases. Adam teaches that the temperature of the first substream of combustion offgases is reduced to a value by passing through a heat exchanger (230) before it is mixed with the second substream of combustion offgases (see paragraph [0037], Figure 5). Adam further teaches an embodiment that the system has the capability to maintain the exhaust gas in a range as shown in Figure 9. In Figure 9, the temperatures of some of the test sample are maintained in a range between 500 to 800ºC (e.g. 600°C) (see Figure 9).

Applicant argues that the present application is directed to enriching the offgases of the first substream for testing the catalyst; Adams is more concerned with having lean offgases. Thus Adams teaches away from the claimed method. Examiner does not agree that Adams teaches away from the enriching the offgases. According to the instant specification, “The air/fuel ratio for stoichiometric combustion of conventional motor fuel is about 14.6, i.e. 14.6 kilograms of air are required for complete combustion of one kilogram of fuel. The air ratio lambda at this point is equal to 1” (see page 2, lines 29-32). Adams teaches that non-engine based exhaust component rapid aging system is capable of operation at an air to fuel ratio of about 7 to about 16 (see paragraph [0014]). Therefore, Adams teaches the range of condition that includes enriched offgases (air to gas ratio less than 14.6). Adams also teaches lean gases (air to fuel ratio about 17 and even about 18) (see paragraph [0046]) and then enriches the offgases of the first substream with the second substream offgases (see paragraph [0047]).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT XU whose telephone number is (571)270-

5560. The examiner can normally be reached on Mon-Thur 7:30am-5:00pm, Fri 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

11/8/2009

/Yelena G. Gakh/
Primary Examiner, Art Unit 1797

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